CLAIMS

We Claim:

1. A method of detecting increased S6 kinase activity in a subject, comprising:
   a) providing a biological sample from a subject; and
   b) detecting the presence or absence of increased S6 kinase activity in said biological sample.

2. The method of claim 1, wherein said detecting the presence or absence of increased S6 kinase activity comprises a S6 kinase phosphatase assay.

3. The method of claim 2, wherein said S6 kinase phosphatase assay comprises hybridizing a phosphospecific antibody to a S6 kinase substrate.

4. The method of claim 1, wherein said increased S6 kinase activity is indicative of an inactivated protein selected from the group consisting of TSC1 protein and TSC2 protein.

5. The method of claim 1, further comprising providing a diagnosis to said subject based on said detecting the presence or absence of increased S6 kinase activity.

6. The method of claim 1, further comprising the step of providing treatment for tuberous sclerosis to said subject, wherein said treatment comprises administering a S6 kinase inhibitor to said subject.

7. The method of claim 6, wherein said S6 kinase inhibitor comprises rapamycin.

8. A method of screening compounds, comprising:
   a) providing
      i) a cell expressing S6 kinase; and
      ii) one or more test compounds; and

b) screening said test compounds for the ability to inhibit the kinase activity of said S6 kinase.

9. The method of claim 8, wherein said screening said compounds for the ability to inhibit the kinase activity of S6 kinase activity comprises a S6 kinase phosphatase assay.

10. A method of treating a disease, comprising:

a) providing:

i) a subject, wherein said subject suffers from a disease, wherein said disease comprises defective cells, wherein said defective cells comprise a defective TSC pathway;

ii) an agent; wherein said agent reduces cellular ATP levels; and

b) administering said agent to said subject; wherein said agent targets said defective cells.

11. The method of Claim 10, wherein said agent is selected from the group consisting of: a hexokinase inhibitor, 2-deoxy-glucose, a PKC inhibitor, Rottlerin, and 5-aminoimidazole-4-carboxyamide ribonucleotide.

12. The method of Claim 10, wherein said agent is mitochondrial uncoupler FCCP.

13. The method of Claim 10, further comprising co-administration of rapamycin.

14. The method of Claim 10, wherein said disease is tuberous sclerosis.

15. The method of Claim 10, wherein said disease is cancer.

16. The method of Claim 10, wherein said disease is cardiac hypertrophy.

17. The method of Claim 16, wherein said agent is rapamycin.

18. The method of Claim 10, wherein said defective TSC pathway comprises a defective element of said TSC pathway selected from the group consisting of: TSC1, TSC2, Rheb, mTOR, S6K, and 4EBP-1.

5